
Space Weather Forecast

Issued on Sunday, 07 January 2024 at 13:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: R1 Minor Radio Blackouts considered Likely throughout. Slight chance of Minor Geomagnetic Storm G1 throughout. Waning chance of S1 Minor Solar Radiation Storm.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low, with frequent low to mid-ranking common class flares and a peak seen at 06/1535UTC. There are now up to ten sunspot regions on the solar disc. The largest spot resides in the southeast, with two weak delta spots present, increasing it's magnetic complexity. The complex sunspot in the north near centre disk, also saw development in its leading region, with a ring of spots of opposing polarity and a reformation of a delta region. The other notable increase was from the new region near centre disk just south of the equator, this spot is developing quickly. All other spots have shown little change, and are comparatively simple.

A filament eruption and subsequent coronal mass ejection was seen to emerge from the northeastern quadrant around N30E30 at 06/1330UTC. This passes 1AU around the turn of the UTC day 09 into 10 January as a very slight glance. No further Earth-directed coronal mass ejections have been observed at this time.

Solar Wind / Geomagnetic Activity: Solar winds showed an apparent slow regime. The solar wind speed was at or near-background levels, with the number of particles and their associated magnetic field small-scale and unremarkable.

The net result of the above solar wind measures gave Quiet geomagnetic activity throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed: there was a continued gradual decline in proton counts in the near-Earth environment, as seen in recent days towards resting background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a level daily chance of Moderate-class flares throughout, and a slight chance of Strong-class.

Solar Wind / Geomagnetic Activity: Up to two coronal mass ejections feature at present and one fast wind regime. The most likely course of events is for the fast wind to arrive within the first 24 hours, with the northeast quadrant coronal mass ejection from 04 January then due in the following 24 and the second east-central coronal mass ejection from 06 January perhaps following after yet another 24 hours - each with decreasing confidence.

The net result is a falling Slight Chance of G1/Minor Storms through the four days, perhaps most reliably Quiet at the very start and end of the period.

Energetic Particles / Solar Radiation: In the absence of further proton-rich X-ray flares in prone locations, levels may be allowed to relax back to resting background before the middle of the coming UTC working week, with a chance of Minor Solar Radiation Storm S1 falling to a slight chance with time.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	20	20	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	20	20	20	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)